

### REMARKS/ARGUMENTS

#### Specification Objection

The specification was objected to on the basis of a typographical error. The applicant agrees and submitted a replacement paragraph with a corrected patent number.

#### 35 USC § 112

Claims 1-4 were rejected under 35 USC § 112, first paragraph, as lacking enablement for devices with certain skirt heights and numbers and slots. More specifically, the examiner stated that it would be clear from the specific examples in the specification that bubble caps having a skirt height of at least 4 cm and less than 3 slots would not be intended to have a skirt height of less than 7 cm.

The applicant respectfully disagrees. It appears as though the examiner would argue that because the table on page 12 does not make reference to specific bubble caps (i.e., those having less than 3 slots and a skirt height of less than 7 cm), such bubble caps would not be intended to be encompassed in the inventive subject matter.

First, the MPEP at 2164.08 clearly points out that the only relevant concern should be whether the *scope of enablement provided to one skilled in the art by the disclosure is commensurate with the scope of protection sought by the claims* (AK Steel Corp. v. Sollac, 344 F.3d 1234, 1244, 68 USPQ2d 1280, 1287 (Fed. Cir. 2003); In re Moore, 439 F.2d 1232, 1236, 169 USPQ 236, 239 (CCPA 1971). See also Plant Genetic Sys., N.V. v. DeKalb Genetics Corp., 315 F.3d 1335, 1339, 65 USPQ2d 1452, 1455 (Fed. Cir. 2003)). Moreover, the analysis is driven by the inquiry *if one skilled in the art is enabled to make and use the entire scope of the claimed invention without undue experimentation*. In the instant case, all a person of ordinary skill in the art needs to do is perform a calculation as outlined on page 13, for which the table on page 12 provides exemplary results.

Moreover, the applicant expressly stated on page 11 with specific reference to the table on page 12 that "...many different combinations of skirt heights with numbers of slots and slot lengths are contemplated to be commercially important. The following table lists some of those combinations..." (emphasis added). Clearly, the table is NOT intended to limit the scope of the

subject matter. The applicant's position in this regard is unambiguously affirmed by the MPEP at 2164.08: "...Limitations and *examples in the specification do not generally limit what is covered by the claims...*(emphasis added)".

Finally, there are numerous permutations of configurations that will satisfy the equation and conditions given in the specification, which will also fall within the scope of claims 1-4. For example, where the skirt height is between 4 and 7 cm, the slot length is 6 cm, and the exposed slot height is equal or less than 4.5 cm, bubble caps will squarely fall within the claimed subject matter. Such bubble caps are clearly included in the description on page 13.

### 35 USC § 102(b)

Claims 1-16 were rejected under 35 USC § 102(b) as being anticipated by Ballard et al. The applicant disagrees, especially in view of the amendments herein.

As amended, claims 1, 5, 9, and 13 require that the "...Exposed Slot Height is determined to equal  $44.2 * X^{0.52}$ , wherein X is  $Q_v * (W_s * N_s)^{-1} * [\rho_v / (\rho_l - \rho_v)]^{0.5}$ , wherein  $Q_v$  is a vapor volumetric rate flowing through the cap,  $W_s$  is mean slot width (cm),  $N_s$  is number of slots,  $\rho_v$  is the vapor density ( $\text{kg/m}^3$ ), and  $\rho_l$  is the liquid density ( $\text{kg/m}^3$ )..." *These specific limitations are neither literally nor inherently present.* Consequently, claims 1-16 should not be deemed anticipated by Ballard et al.

### 35 USC § 103

Claims 1-16 were also rejected under 35 USC § 103 as being obvious over Ballard et al. Again, the applicant respectfully disagrees.

Particular attention is directed to the express requirement of all claims that demand that the Exposed Slot Height is determined to equal  $44.2 * X^{0.52}$ , wherein X is a composite measure that takes into account the vapor volumetric rate flowing through the cap, the mean slot width, the number of slots, the vapor density, and the liquid density. the so defined Exposed Slot Height is then integrated into the geometrical requirements of the bubble cap. Among other places, the summary of the invention paragraph points to the specific advantages and parameters obtained

using such bubble caps while there is no teaching suggestion, or motivation in Ballard to that effect.

On the contrary, with respect to the *skirt height* Ballard teaches (e.g., on column 8, line 52 et seq.) that "...the lower rims of the distribution caps can be *adjusted to any level* above the distribution tray so long as the flow of gas through the downcomers is not sealed off...(emphasis added)" and then goes on to provide a rather wide numerical range. Similarly, with respect to the *slot length*, Ballard teaches that the slot length is "...preferably...from about  $1/8$  to about  $1/2$  of the depth of the cap..." (column 5, line 48 et seq.), and even points out that the cap "...can also be left unslotted..." (column 5, line 48 et seq.). With respect to the *exposed slot height*, Ballard simply requires that the "...top of the slot should be maintained below the bottom of the of the upper rim of the downcomer..." Such teaching not only entirely fails to appreciate the criticality of the claimed dimensional limitations, but teaches against the presently pending claims.

Moreover, Ballard further teach away from the claimed subject matter by elaborating that improved results (better fluid dispersion across a column) are achieved "...when the bottom rim is slotted equidistantly around its periphery...(column 5, line 43)", and that "...greater distribution of the liquid over the cross section of the vessel [is achieved using] flared sections [in the riser]...(column 6, line 51)" Clearly, Ballard solves the problem he addressed using his configurations. Thus, there is no motivation in Ballard to modify his teachings such as to arrive at the presently claimed subject matter. Consequently, as Ballard teaches away/against the present claims, claims 1-16 should also not be deemed obvious over Ballard.

In view of the present amendments and arguments, the applicant believes that all claims are now in condition for allowance. Therefore, the applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

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